

similar nature in almost every quarter of the world; and then referring to the valuable remains of the Acropolis, in the British Museum, which so expressively speak of the palmy days of Pericles, the imagination at once takes flight and visits every celebrated nook and corner of which a Homer and a Virgil sang. Egypt, with its colossal witnesses of man's pride, and Palestine, with all the interesting scenes of the incarnation of the Deity, and all the memories and associations which such scenes naturally incite, were next brought under notice, and every spot of our own country, from its mountain fastnesses to its verdant valleys, was hallowed by mystic tradition or circumstances of historical celebrity, from the Teutonic altars of Odin and Thor to the purer house of prayer, with its heaven-directed spire.

Mr. Thomas concluded in nearly these words:—"Let us hope that now, when the spirit of inquiry stalks majestically through the whole land, that the noble and delightful science of architecture will be better appreciated and more properly analysed. When it will be viewed as one great medium, connecting the weary walks of ordinary life with purer element, as the only occupation by which man finds employment for the greatest physical energies, in connection with those higher excursions of the imagination for which he feels himself born, and which enables him to contemplate all his loftier ideas, to view the great end for which man was created, and to feel and test the vast power of that ethereal essence, which must endure beyond this bound of Nature and of Time. This supremacy of architecture, connected as it is with the two sister arts, Painting and Sculpture, and their capability of counteracting the evil and Epicurean effects of almost every pursuit in these days of cold, calculating utility, is more and more required as the world progresses. It is required to withstand the invasion of cold and artificial customs; it is required to spread our sympathies over all classes of mankind, to knit us by new ties with our fellow-creatures of every other nation, being the only art which admits of universal combination without betraying the depravity of our species; it is required to redeem man from those selfish, mercenary ideas to which human nature is naturally prone; it is required to bring out, increase, and soften the beauties of nature, for which purpose these expansive powers may have been implanted in our hearts; and above all, it is required as a powerful incentive to raise us above this world, and its poor enjoyments, to the contemplation of the great Architect of the Universe, and the acquirement of true happiness in a purer and holier atmosphere."

Mr. Thomas was repeatedly interrupted by the marks of approbation of his audience, having succeeded in investing his subject with suitable interest.

#### SUGGESTIONS ON THE CHEMICAL CHARACTERS OF CONTAGION, AND THE NATURE OF THE EXHALATIONS GIVEN OFF FROM THE WANT OF VENTILATION, DRAINAGE, AND SEWERAGE, AND IN THE CONFINED DISTRICTS AND ABODES OF THE POOR, &c.

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THAN drainage, sewerage, and ventilation, and the accumulated evils which arise from their neglect, there is no subject of greater importance in the whole range of hygiene. It is a matter of remark that in this country, and, in fact, many others, diseases have become greatly modified in their character; in many, from improved systems of diet, but in other instances, from more attention being paid to insure the purity of the atmosphere. The Pontine Marshes, near Rome, are allowed to remain untouched, productive of the most fatal malaria, and epidemical diseases of the most inveterate form, whilst in our own country, nearly every marsh has been drained, and ague is almost extinct. Sierra Leone owes its title of the Grave of Europeans to the marshy lands on which the luxurious vegetation of the tropical regions, with the numerous forms of animal life, putrefy and decay; and were we once to get rid of the cause, the effects would cease, and, in all probability, the country would be as healthy as our own. Chemical fumigating or disinfectant agents were tried, but

without effect, to neutralize the poisonous miasms on the late lamentable Niger expedition, by the use of chlorine gas. Next in importance to drainage, comes sewerage, to take off the decaying matters from our houses, and remove them from the spot where their decomposition would produce the most noxious results. Ventilation is of no less consequence in the removal of air already vitiated by respiration, or impregnated with the products of combustion, or the exhalations from decaying, decayed, or diseased bodies.

It is scarcely possible to say to what an extent a neglect of these important matters is the cause of disease in close and confined districts, where not a breeze of air comes in to disturb the still of the polluted atmosphere. The annals of medicine and the bills of mortality portray it too strongly to need any particular proofs; and when any old disease is revived, or new one introduced, it is sure to meet here with its first, and always its most numerous, victims. Notwithstanding some of the remarkable and anomalous careers of the distribution of these diseases, and the peculiar range that they take, it is always certain that these suffer most from epidemics. Many courts, alleys, and narrow streets in the metropolis (and doubtless in other towns), are, it is well known, never free from typhus fever, and the squalid appearance of the wretched inhabitants shews the very unhealthy character of the localities. Here we still find no sewerage; drains and gutters running down the middle of the streets; accumulated heaps of filth, and puddles saturated with all manners of decaying garbage, from which emanate gaseous compounds of the most noxious and subtle forms. Thus the pure atmosphere inhaled by the country peasant, which gives him the bloom of health, becomes saturated with poisonous matters of the most noxious kinds; nor are the effects confined to the districts in which the poor generally reside; for the incipient seeds of disease and death, wafted by the winds to considerable distances, reach the abodes of the heedless rich, who, insensate to their wants and sufferings, reside in more airy abodes and better ventilated districts. And when we look at the abodes of the poor, how much is there not to excite our sympathy and demand our exertion! Their houses have bad ventilation—their narrow courts want drainage—they have not water sufficient scarcely for domestic use, and still less for purposes of cleanliness. When the gardener wants to bleach a plant, he secludes it from the light; and here, almost immured in darkness, a most baneful influence is exerted on their health. One solitary room, with no convenience, is the only place in which all their processes of cooking and domestic economy are performed;—it is at once their sleeping-room, their kitchen, their workshop, and their constant abode. They cannot ventilate the room by opening the window, fearful of the descending smuts from an adjoining chimney. The luxury of white-washing their walls, by which adherent matters and incipient disease might be destroyed, and their deficiency of the light of heaven in some measure compensated for in its reflection, is denied them. The keeping of pigs, donkeys, and domestic animals, adds but to the accumulated evils; and, apart from the moral associations rendered, what a fearful share have not the condition and abodes of the poor in the contamination of the atmosphere, and the consequent propagation of disease!

These observations may lead us more successfully to the consideration of miasms,—those unseen and subtle causes of disease, the existence of which we reason by analogy, and of which much has been said, although little is known. We know that decomposing animal and vegetable matters produce carburetted, sulphuretted, and phosphuretted hydrogen gases, with ammonia and its compounds;—we may collect and submit these gases to experimental observation, though it is probable that others still exist, although in a state too recondite for investigation by our present resources. The last few years have added to our list of gaseous products cyanogen, a compound of nitrogen and carbon, which is the basis of Prussic acid, the most suddenly fatal and destructive of all poisons, which gas is also highly poisonous even in a very dilute form. The effect of unseen exhalations, but of the existence of which we are assured by

reference to other senses, is very different on the human constitution. Amongst these we recognize odours; which, as every organic compound is defined in its nature and composition, we may also consider to be chemical compounds, guided by the same laws as characterize substances which we can see, feel, taste, or handle. So convinced were the ancients of this, that they applied them as medicinal agents; and now some attribute to the odour of a cow-house, or the exhalation of newly-ploughed earth, a curative influence in consumptive cases. From inhaling the odour of beef the butcher's wife obtains her obesity; and that most disgusting of all trades, cut-gut manufacture, is amongst the most healthy of employments. So there are exhalations which have a noxious effect, and which we equally assume to be chemical compounds, not only affecting the body itself by its immediate influence, but acting upon a large body of an impure atmosphere, which it either changes by virtue of a certain chemical action, or this merely acts as a diluent for the more extensive propagation and diffusion of the poison. The situations in our towns where epidemics and contagious diseases mostly prevail are notoriously those which are most filthy and dirty; and the individuals chiefly attacked, those who, being most careless in their habits, may be supposed to carry around them an atmosphere most easily susceptible of impregnation. This view of the constitution of miasm is supported by reference to those substances, or chemical re-agents, which have attained reputation as disinfectants. Amongst these are chlorine and nitric acid, two most powerful chemical agents. Vinegar and camphor have long held repute as prophylactics; and, however ridiculous it may appear, we should not discard at once and without inquiry what has been the belief of ages, handed down to us probably as those were, the long experience of past times. Now vinegar is a powerful chemical solvent, and camphor assists in the solution of many substances which are with difficulty soluble. Charcoal in a minute state of division has a strong absorbing power for colouring matter and gaseous substances, so that if some be introduced into a jar of gas it will disappear. We have it in this minute state of division in the smoke of the burning brown paper, the popular purifier of the sick room. Heat is used in the fumigation of the clothes of persons infected with the plague, and if it destroy the *fomites*, it is by the separation of those elements which form the poisonous compound of contagion. If these substances are effectual, it is from their chemical action, and that energy can only be exerted upon chemical substances. The great improvements which have taken place in the public health have been chiefly owing to the means which have been adopted to preserve the atmosphere from contamination with these compounds of known and presumed existence. Three or four centuries back, houses were built in as close and narrow a space as possible, and land was economized as much as possible in their erection—no means were afforded for cleanliness or ventilation—drainage was not thought of, and hence the plague, sweating-sickness, and other fatal disorders and epidemics incidental to those periods were treated but as matters of course. Modern chemistry, however, teaches us the composition of air, and how to respect its purity; that pure air is essential to all the functions of life, and that whatever affects its purity must possess an injurious effect upon the constitution. We learn from it that stagnating ditches, stinking cess-pools, open drains and crowded bed-rooms, cannot long remain without producing disease—that they elaborate noxious gases, the formation of which must be prevented before we can secure immunity to health. We find that houses cannot be near each other, nor rooms over-tenanted, without a palpably injurious effect—that mistakes still exist which require rectification; but we cannot hope to obtain a remedy until the public are become more alive to the evils from which they suffer. Committees of the House of Commons have unequivocally condemned "interment in towns," and the "ouissance from smoke in the chimneys of furnaces," and yet no legislative enactments have been directed to remedy or remove these noxious evils, prejudicial to a great extent in the local contamination of the